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# 20

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## The Commissioner of Patents and Trademarks

*Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.*

*Therefore, this*

### United States Patent

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*Bruce Lehman*

Commissioner of Patents and Trademarks

*Pandra J. Morton*

Attest



US005683938A

**United States Patent** [19]

Kim et al.

[11] **Patent Number:** 5,683,938[45] **Date of Patent:** Nov. 4, 1997[54] **METHOD FOR FILLING CONTACT HOLES WITH METAL BY TWO-STEP DEPOSITION**[75] **Inventors:** Sang Young Kim; Yung Wook Song; Hun Do Kim, all of Seoul, Rep. of Korea[73] **Assignee:** Hyundai Electronics Industries Co., Ltd., Kyoung Ki-Do, Rep. of Korea

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[21] **Appl. No.:** 327,887[22] **Filed:** Oct. 24, 1994**Related U.S. Application Data**

[63] Continuation of Ser. No. 964,362, Oct. 21, 1992, abandoned.

[30] **Foreign Application Priority Data**

Oct. 21, 1991 [KR] Rep. of Korea ..... 91-18500

[51] **Int. CL<sup>6</sup>** ..... H01L 21/28[52] **U.S. Cl.** ..... 437/192; 437/195; 437/981[58] **Field of Search** ..... 437/192, 195, 437/189, 190, 981[56] **References Cited****U.S. PATENT DOCUMENTS**

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*Primary Examiner*—John Niebling*Assistant Examiner*—Thomas G. Bilodeau*Attorney, Agent, or Firm*—Merchant, Gould, Smith, Edell, Welter & Schmidt, P.A.[57] **ABSTRACT**

Method for filling contact holes with metals by two-step deposition of selective tungsten layer is disclosed. The selective tungsten thin films are deposited in two steps, thus maximizing the contact filling with tungsten, gaining a stability of metal wires with better step coverage, and enhancing the reliability on semiconductor element.

**5 Claims, 3 Drawing Sheets**